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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 10/675,598
Filing Date: September 26, 2003
Appellant(s): CRONCE, DONALD T.



Gerhard W. Thielman
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed June 21, 2007 appealing from the Office action mailed December 29, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The amendment after final rejection filed on March 13, 2007 has been entered.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 6,255,009 | Rusek et al | 7-2001 |
| 4,867,902 | Russell | 9-1989 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-9, 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rusek et al (6,255,009) in combination with Russell et al (4,867,902).

Rusek et al disclose a system for providing a potential chemical energy for devices to perform work using hydrogen peroxide as the primary reactant. The hydrogen peroxide comprises an impellant. An impellant is a chemical which contains energy releasable by decomposition without combustion. The hydrogen peroxide powers electric and/or propulsion systems on carriers and/or serves as the primary power source and/or auxiliary equipment on other like devices. Sizes of the turbine and/or electric motor drives are proportional to the anticipated use requirement, such as the size of the carrier or moving distance of a lever arm. The invention provides for environmental conditioning such as heating elements, electricity generation and other like systems. The hydrogen peroxide based impellant eliminates toxic emissions, increases reliability and efficiency, reduces sound and obscures carrier signature relative to conventional fuels. See col. 3, lines 14-34. The system and method for performing work comprises the steps of providing an impellant of hydrogen peroxide, decomposing the impellant, wherein the decomposition releases energy and directing the released energy to perform work. Performed work includes mechanical, electrical and chemical work. The impellant acts as a fuel, propellant, and environmental conditioner. The impellant provides such products such as breathable oxygen at comfortable temperature, warm and cold potable water, electrical power, heat and the

like. The performed work may be used on any mechanical device which may used pressure-volume work to function. These mechanical devices include, turbines, Stirling cycle engines, mechanical heat engines, lifts, presses, retractors, extenders and other applications of internal combustion engines and diesel engines. See col. 3, lines 40-59. The hydrogen peroxide may include additional components which include storage stabilizers or chemical reaction inhibitors known to those skilled in the art. See col. 4, lines 1-5. A holding tank containing a high strength hydrogen peroxide meters the hydrogen peroxide to a catalytic decomposition chamber through a valve. Within the catalytic decomposition chamber, the high strength hydrogen peroxide decomposes to superheated steam which comprises water vapor and oxygen. See col. 5, lines 43-47. Decomposition of the hydrogen peroxide within the catalytic decomposition chamber comprises at least one catalyst. See col. 5, lines 58-60. The superheated steam and oxygen is fed from the catalytic decomposition chamber into either a shipboard steam turbine or used directly for thrust vectoring. When used in the steam turbine, the energy in the water vapor is used to provide mechanical power, heat water or other fluids which drive a closed cycle heat engine. The steam turbine may provide amounts of power of from about 5000 HP and below. The steam may also be used to boil fluid in a closed cycle engine. The steam turbine is mechanically coupled to a propeller to provide shaft work, such as propelling the vessel through the water. The steam turbine may also be attached to an axial power generator. The axial power generator provides power for electronics on board the vessel and other auxiliary power. The axial power generator may further provide power to an electric motor which provides shaft work for use in

steering and/or maneuvering the vessel. The steam turbine further provides a source of oxygen. See col. 6, lines 3-28. In addition to feeding the steam turbine, the super heated steam is fed from the catalytic decomposition chamber into a thermoelectric or thermionic generator. The thermoelectric or thermionic generator provides DC power for use in direct current systems on board a vessel. Superheated steam is fed to the thermoelectric or thermionic generator at an appropriate decomposition temperature, the efficiency of which increases with an increase in temperature. See col. 6, lines 37-45. The patented invention includes a power system comprising an impellant of hydrogen peroxide, means for decomposing the impellant, wherein energy is released and means for producing work from the released energy. The power system provides released energy which provides mechanical, electrical and/or chemical work in the primary and auxiliary systems of mechanical devices, such as carriers, and/or environmental conditioning such as heat. As such, the hydrogen peroxide powers carriers or stationary devices without expending environmentally damaging waste from impellant residue. See col. 7, lines 5-15.

The prior art of Rusek et al does not disclose that the peroxide is solid.

Russell discloses an oxygen generating microencapsulated composition comprising a core material comprising an oxygen generating compound and a coating comprising an acceptable wall forming polymer which is swellable in water, wherein the core material is an alkali metal superoxide or peroxide. See col. 2, lines 33-47. The encapsulation slows down the reaction of the alkali metal oxide with water, so that the exothermic heat created is less than that created by conventional methods. See col. 3,

line 61 – col. 4, line 4. Besides potassium superoxide, other chemicals that release oxygen by reaction with water can be utilized such as alkali and alkaline earth metal peroxides, superoxides, trioxides, percarbonates and permanganates. See col. 4, lines 31-35 and 51-55.

Although the prior art of Rusek et al does not disclose the use of a solid impellant of at least one of a peroxide or a superoxide, it is shown in the prior art of Russell that solid impellants of peroxides and superoxides exist as a core material coated with a polymer to slow down the reaction of water with the peroxide or superoxide so that less exothermic heat is produced to prevent carbonate sludge from being formed and controlled release of the oxygen is obtained. One having ordinary skill in the art would be motivated to use a controlled release system of a solid impellant of a peroxide or superoxide in place of the liquid hydrogen peroxide to yield a system which is controlled with consistent release of oxygen and lower exothermic heat being produced rather than using a liquid which reacts extremely quick and is uncontrollable.

**(10) Response to Argument**

In response to Appellant's Claimed Features re Issue A:

Regarding the appellant's arguments directed to the independent claims 1 and 12, appellant sets forth that the independent claims are directed to power generation by chemical decomposition described in the specification at page 8, line 5 through page 9, line 7 corresponding to paragraphs 0021-0022 and Figures 1 – 2. Appellant's claims are directed to a system and a process for power generation by decomposition of a solid impellant.

The examiner agrees with this assessment.

Appellant further sets forth that the independent claims are directed to chemical energy release for a power generation system in which a solid impellant is decomposed in a decomposition chamber with a solvent to release thermal energy. A steam turbine converts the thermal energy into mechanical energy to drive a shaft for work output to, for example a thruster. A thermoelectric generator converts the thermal energy into electrical energy to power a direct current motor.

The examiner agrees with this assessment.

Appellant further sets forth that independent claim 1 recites a system for power generation including a decomposition chamber, a solid impellant material containing at least on of a peroxide and a superoxide; a solvent in the decomposition chamber to liquefy and chemically decompose the solid impellant, to release thermal energy; a power generator to convert the thermal energy into a least one of mechanical energy

and electrical energy; and a power transmission to transfer the converted energy to perform work.

The examiner agrees with this assessment.

Appellant further sets forth that independent claim 12 recites a process for releasing energy by providing a decomposition chamber containing a solvent; dissolving a solid impellant material containing at least one of a peroxide and a superoxide; solubilizing the solid impellant material in the solvent to liquefy and chemically decompose the solid impellant material into a liquefied peroxide for releasing thermal energy; converting the thermal energy into at least one of mechanical energy and electrical energy; and transferring the converted energy for performing work.

The examiner agrees with this assessment.

In response to Appellant's Reference Teachings re Issue B

Appellant sets forth that Rusek discloses a power generation method using hydrogen peroxide decomposition and that Rusek teaches an electrolytic hydrogen peroxide producer to convert seawater to be filtered in a purifier and stored in a holding tank for subsequent disposition via a valve to a catalytic decomposition chamber. The hydrogen peroxide can be applied to a thermoelectric generator, steam turbine or other applications. Applicant states that there is no motivation to replace hydrogen peroxide with a solid material and dissolving with a solvent.

The examiner disagrees with this assessment, since the Rusek patent is not being used as a single reference in the rejection but instead is being used in

combination with Russell to reject applicants instant invention as set forth as will be discussed further in detail below.

Appellant further sets forth that Russell discloses encapsulation of alkali superoxide particles with a thin polymer coating to attenuate an oxygen generating reaction. This superoxide may form solid particles or liquid droplets. Russell sets forth swelling and exfoliation of the microcapsule wall, rather than dissolving a solid impellant into a solvent to produce liquefied peroxide with respect to claim 12.

The examiner disagrees with this assessment. Appellant is arguing that the polymer does not dissolve but instead is swelled and exfoliation of the microcapsule wall is broken down. Appellant has misconstrued what Russell is teaching. Russell has placed a polymer around individual solid particles of potassium superoxide which oxide when reacted with water releases oxygen. The water or moisture is used to not only break down the polymer by swelling and exfoliation but also to dissolve the solid oxide impellant of the superoxide by reacting with water to dissolve the solid impellant gradually through the exfoliation to increase the amounts of the surface of the core material particles of the superoxide being dissolved. The micro encapsulation of the solid impellant in a polymer is to enable slow release of the superoxide reaction with water. See col. 3, lines 13-16, 42-55 and col. 3, line 61 – col. 4, line 4.

Appellant further sets forth that Russell identifies the reaction of potassium superoxide in water as sufficiently exothermic to conventionally require heat exchangers for thermal dissipation, this represents waste heat as an undesired by product of the reaction for the purpose of oxygen generation and that by observing thermal energy that

is undesirable for the intended purpose, Russell teaches away from Appellant's claimed features for converting thermal energy to produce electrical power.

The examiner disagrees with this assessment. Appellant is arguing information that is set forth in the background of the Russell patent which pertains to what is known in the past and has nothing to do with the patented invention of the Russell patent except that it is known that potassium superoxide generates exothermic heat. The Russell patent discloses the use of a polymer to encapsulated potassium superoxide to slow down the reaction of the superoxide with that of water to control the release of exothermic heat, unlike the prior art that is cited in the background information of the Russell patent. The use of the polymer to slow the reaction of the superoxide with water through the exfoliation of the polymer is the novelty of the Russell patent and since this slower reaction is achieved, heat exchangers are not needed and therefore, it appears that appellants assessment of the invention and its use in combination with Rusek is incorrect, and therefore, proper motivation does appear to have been used, since slowing the reaction rate through the use of polymer encapsulated potassium superoxide rather than using a liquid peroxide which would have been a fast reaction rate, would have been within the ability of the person having ordinary skill in the art, in order to control the energy being emitted and supplied.

In response to Appellant's Lack of Motivation to Combine re Issue C

Appellant sets forth that there is no motivation to combine features related to the power generator of Rusek with the oxygen producer of Russell. That the respective teachings focus on concerns completely unrelated to the other, and that their

incompatibility engenders rejection on their combination, as Russell seeks to dissipate thermal energy, whereas Rusek desires to convert and use that source for power, and that a prima facie case of obviousness has not been established. The appellant further argues that neither Rusek et al or Russell teaches solid impellant for producing power or dissolving the impellant in a solvent to produce liquid peroxide.

The examiner disagrees with this assessment. Rusek et al does in fact teach generation of power as can be seen by the Figures and the abstract. Even though Rusek et al does not disclose the use of a solid impellant does not preclude one having ordinary skill in the art from looking towards Russell for the teaching the solid impellants are known in the art and that these impellants are encapsulated in a polymer for the purpose of generating exothermic heat at a slow release rate so that the exothermic reaction rates may be controlled. It has been held that a person having ordinary skill in the art can implement improvements that are predictable for their established functions and it appears to the examiner that the use of Russell having solid superoxide particles that are encapsulated with a polymer to slow reaction with water to control the exothermic variable is one of those predictable improvements that may be used in the device to Rusek et al, where power generation using an impellant is disclosed.

Appellant further sets forth that Russell sets forth that the peroxide or superoxide is used so that less exothermic heat is produced to prevent carbonate sludge from being formed and controlled release of oxygen is obtained. The examiner is not relying on this teaching for the peroxide or superoxide. The examiner is relying on the peroxide or superoxide which has exothermic heat produced, wherein the exothermic heat can

be controlled and that one having ordinary skill in the art can use this concept of controlling the production of exothermic heat so that it may be used in power generation systems where impellants, whether they be liquid or solid impellants may be used to produce power.

Appellant argues that one having ordinary skill in combining Rusek et al with Russell would be using impermissible hindsight since Russell seeks to mitigate hat production and that is contrary to the objective of both Rusek and Appellant. Further Appellant argues that Rusek fails to teach a solid impellant and that Russell does not compensate for this deficiency because its polymer coating does not constitute an impellant and regulating heat and slag production by restricting exposure of the alkali superoxide particles contradicts the intent of providing power generation on demand.

The examiner disagrees with this assessment. Russell is set forth to teach that impellants of the solid kind whether encapsulated or not are known to exhibit exothermic heat whether controlled release is used or not. The examiner is using this reliance as the basis for use of such an impellant in the power generation of Rusek et al. The use of the encapsulant of a polymer is further manner in which the exothermic heat of the solid impellant may be used to control release of the exothermic heat. The examiner understands that Rusek et al does not disclose a solid impellant, however, that is why Russell is relied upon, to show that solid impellants are known for their release of exothermic heat which is the same requirement as set forth in the Rusek et al patent. The difference is that Rusek et al sets forth an impellant of a liquid impellant to generate the exothermic heat in their power generation system and Russell sets forth that a solid

impellant may be used to generate exothermic heat. Therefore, one having ordinary skill would find the use of a liquid versus a solid impellant material which both generate exothermic heat to be a predictable source of heat generation that would be within the ability of the person having ordinary skill in the art. Further, applicants argue that the polymer does not constitute an impellant. The examiner would like to point out that he is not construing the polymer to be the impellant, the examiner is construing the polymer to be a means to hold the impellant and deter the rate of reaction of the solid impellant particles with the water to form the exothermic heat. Therefore, this point appears moot.

Therefore, the rejection of the claims under 35 USC § 103 over Rusek et al in combination with Russell appears proper in view of the response to the arguments set forth above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Bruce F. Bell

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